Dynamic Trajectory Generation For Spatially Constrained Mechanical Systems Using Harmonic Potential Fields

Masoud, A.A.;Dept. of Electr. Eng., KFUPM, Dhaharan;
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King Fahd University of Petroleum & Minerals

http://www.kfupm.edu.sa

Summary

The harmonic potential field (HPF) approach to motion planning is shown to provide an efficient and provably-correct basis for building intelligent, context-sensitive, and goal-oriented controllers. In the paper by the author (2006) a novel type of dampening forces called: nonlinear, anisotropic, dampening forces (NADFs) are used to convert the guidance signal from an HPF into a navigation control signal with verifiable capabilities. This work provides two extensions of the NADF approach. The first is a blind, iterative procedure that can totally cancel the steady state error. The other extension is concerned with the nonholonomic case. Theoretical developments and simulation results are provided.